March 2, 1937. G. G. GILPIN 2,072,328

HATCH CONSTRUCTION

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Fig. 1.

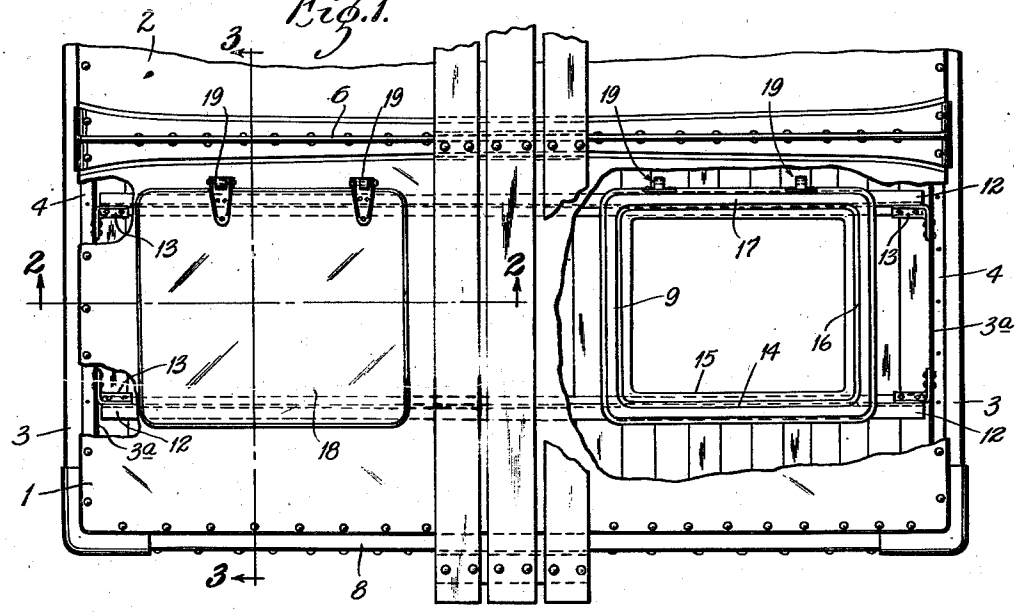


Fig. 2.

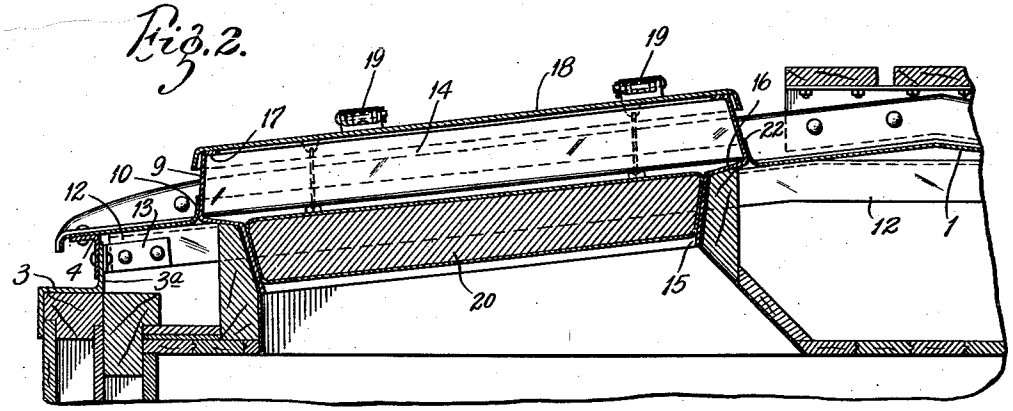
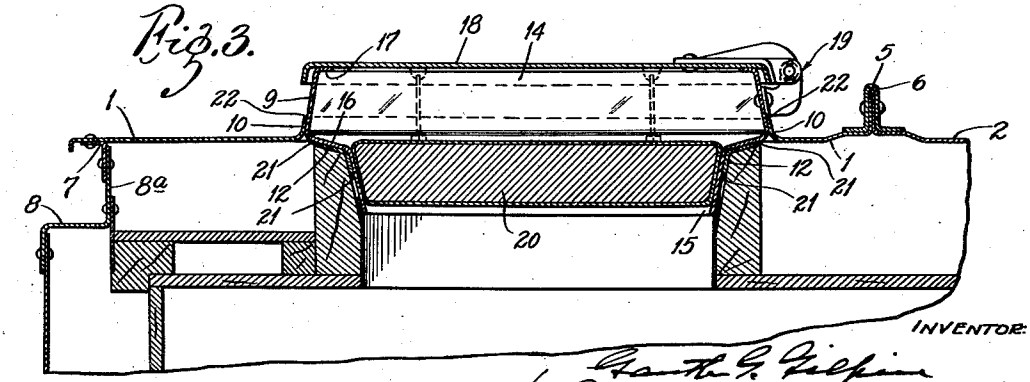


Fig. 3.



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Fig. 4.

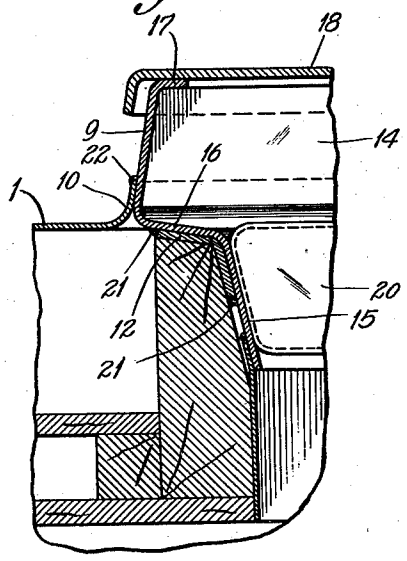


Fig. 5.

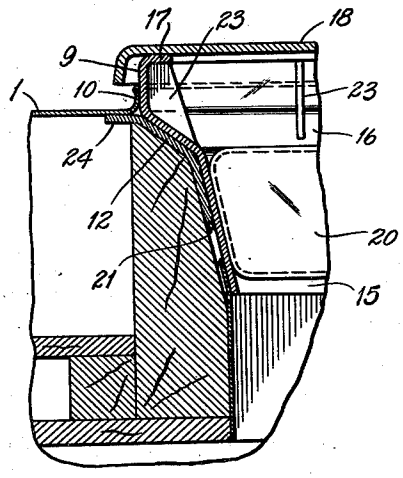


Fig. 6.

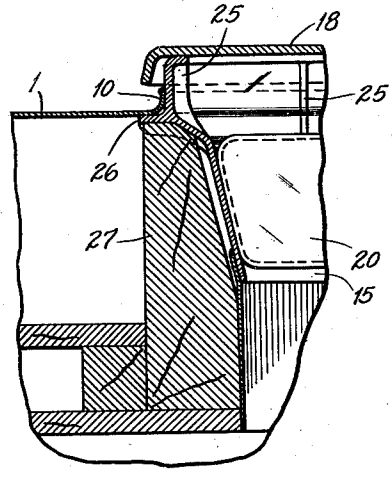
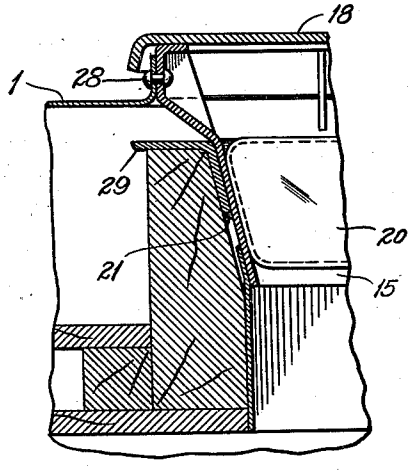


Fig. 7.



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HATCH CONSTRUCTION

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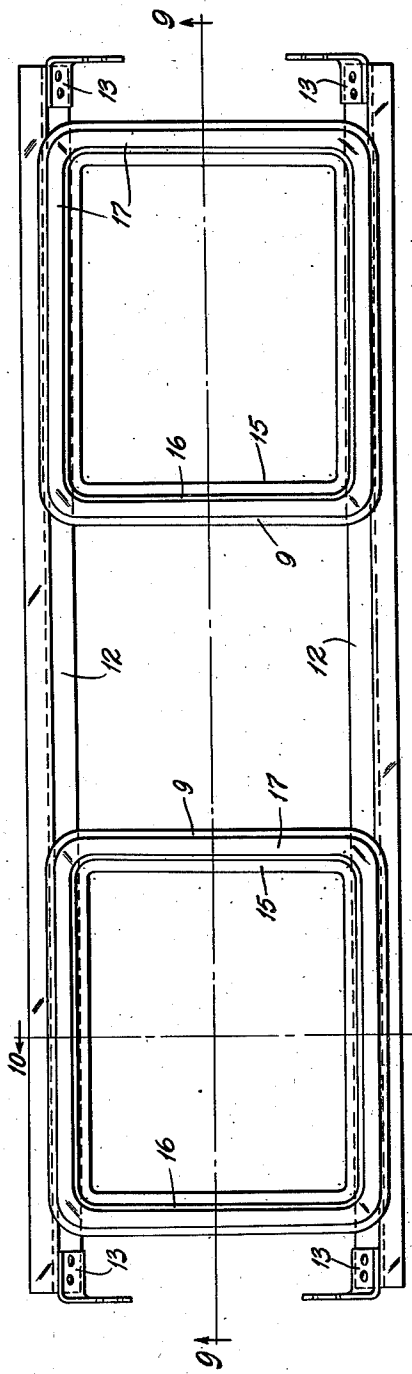


Fig. 8.

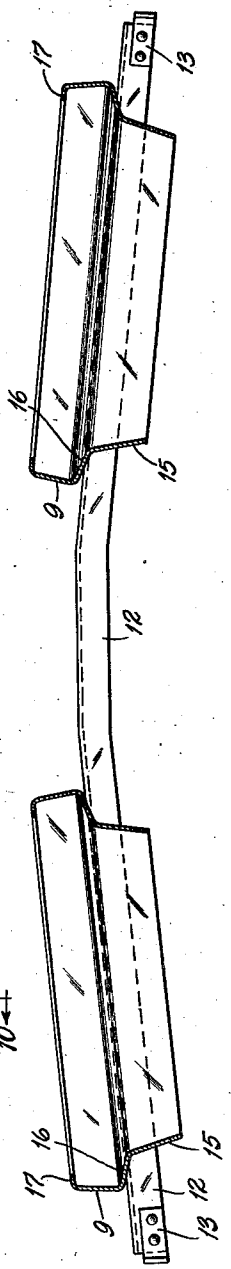


Fig. 9.

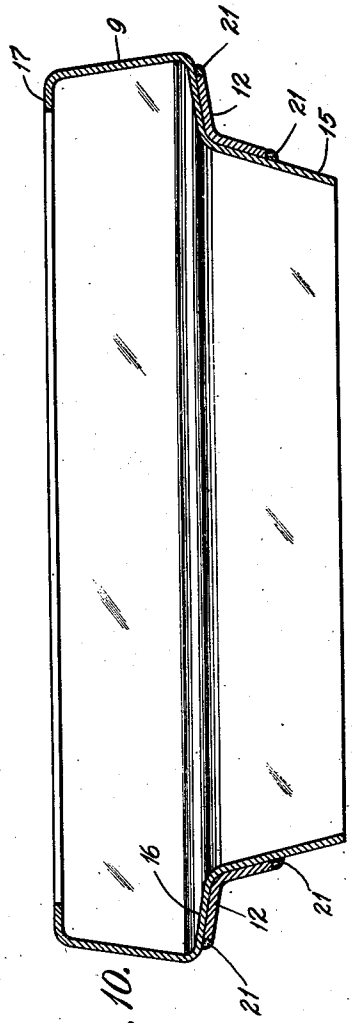


Fig. 10.

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2,072,328

UNITED STATES PATENT OFFICE

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HATCH CONSTRUCTION

Garth G. Gilpin, Riverside, Ill., assignor to P. H. Murphy Company, New Kensington, Pa., a corporation of Pennsylvania

Application December 26, 1935, Serial No. 56,163

22 Claims. (Cl. 108—5)

This invention relates to the hatch construction of a metal car roof. It has for its principal objects to produce a strong, durable, simple and economical hatch construction and to attain other advantages hereinafter appearing. The invention consists in the hatch construction and in the combinations and arrangements of parts hereinafter described and claimed.

In the accompanying drawings, which form part of this specification and wherein like symbols refer to like parts wherever they occur,

Fig. 1 is a plan view of the metal car roof provided on each side of the ridge with a hatch construction embodying my invention, with the hatch cover of one of the hatch constructions and portions of the running board and roof sheet adjacent thereto shown broken away,

Fig. 2 is an enlarged vertical section through one of the hatch constructions, the section being taken transversely of the roof on the line 2—2 in Fig. 1,

Fig. 3 is a vertical section through said hatch construction, the section being taken longitudinally of the roof on the line 3—3 in Fig. 1.

Fig. 4 is an enlarged fragmentary section similar to Fig. 3 through one side of the hatch construction,

Figs. 5, 6, and 7 are views similar to Fig. 4 illustrating three modified forms of hatch construction,

Fig. 8 is a plan view of the preassembled frame or carline assembly shown in Figs. 1 to 4, inclusive,

Fig. 9 is a vertical central longitudinal section of the carline assembly on the line 9—9 in Fig. 8; and

Fig. 10 is an enlarged vertical cross-section on the line 10—10 in Fig. 8.

Referring to the accompanying drawings, my invention is shown in connection with a refrigerator car roof comprising end and intermediate metal roof sheets 1 and 2, respectively, that extend from side plate 3 to side plate 3 of the car and with their ends resting on and riveted or otherwise rigidly secured to the sloping top flanges of eaves angles 4 whose vertical flanges are riveted or otherwise rigidly secured to upstanding inner side marginal flanges 3a of said side plates. The roof sheets are provided along their adjacent margins with upstanding flanges 5 that are straddled by seam caps 6 that are riveted to said flanges and to the top flanges of the eaves angles 4. At the end of the car, the end roof sheet 1 is supported on and riveted or otherwise rigidly secured to the outstanding top flange of an end angle 7, whose vertical flange is riveted or otherwise rigidly secured to the upstanding flange 8a of an end plate 8.

The end roof sheet 1 is provided with one or two hatchways for admitting ice to the interior of said car. The hatch openings are provided with rigid metal frames 9 that are secured to upstanding flanges 10 provided therefor on the end or hatch sheet along the margins of said openings. Each of these metal hatch frames may be made in the form of a casting, or of four frame members welded or otherwise rigidly secured together at the corners of the frame, or of two members bent in the form of U-shaped half sections with their ends disposed in abutting relation and welded or otherwise rigidly secured together.

The metal hatch frames are supported on spaced parallel carline members 12 that extend from side plate 3 to side plate 3 and are rigidly secured thereto. The metal hatch frames span from carline to carline and are rigidly connected thereto and thus form the cross-members of a carline unit or assembly that can be assembled off the car and furnished for application to the car as a complete, preassembled unitary structure. As shown in Figs. 1 to 6, inclusive, the carline members 12 are metal bars preferably of oblique-angle section arranged with their sides converging downwardly and provided at their ends with angle brackets 13 having one flange secured to the side of a carline member and the other flange secured to a side plate.

Each of the metal hatch frames shown in Figs. 1 to 4, inclusive, comprises a relatively wide upper portion 14 located above the general level of the roof, a relatively narrow lower portion 15, located between and resting flatwise against the opposing side faces of the spaced carline members 12 and a shoulder 16 that rests flatwise upon the tops of said carline members. The wide upper portion 14 of the metal hatch frame has upwardly converging side walls that terminate at the top of said frame in an inwardly extending flange 17 that constitutes a seat for a hatch cover 18 that is hinged, as at 19, to one of said walls; the narrow lower portion 15 of said frame has downwardly converging side walls that conform to the downwardly converging sides of the carline members 12 and serve as a seat for a hatch plug 20; and the web, which connects the side walls of the upper and lower portions of said frame and forms the shoulder 16, is inclined inwardly and downwardly to conform to the inwardly and downwardly inclined tops of said carline members. The hatch frame is rigidly secured to the carline members preferably by welds 21 added continuously along the edges of said carline members; and the flange 10 around the opening in the hatch sheet is rigidly secured to said hatch frame by a weld 22 added continuously to the top edge of said flange. As shown in Fig. 4, said flange has a large radius of curvature where it joins the body portion of the hatch sheet and is thus adapted to bear resiliently

against the upwardly converging side walls of the wide upper portion 14 of the hatch frame.

In the modified hatch construction shown in Fig. 5, the wide upper portion of the hatch frame is of uniform width from top to bottom and has vertical plates 23 welded therein that serve as strengthening and stiffening webs therefor, the inclined shoulder and the upper flanges of the carline members have a comparatively steep slope, and the top flanges of said carlines are extended outwardly beyond the hatch frame to form supports 24 for the hatch sheet.

In the modified hatch construction shown in Fig. 6, the hatch frame is made in the form of a casting whose wide upper portion has integral stiffening webs 25 and is provided near the upper end of the inclined shoulder with an outstanding flange 26 that forms a continuous support for the hatch sheet around the hatch opening therein. In this construction, the shoulder and the flange 26 of the hatch frame are supported on the tops of wooden carlines 27, whose opposing faces converge downwardly to conform to the downwardly converging sides of the lower portion of said frame.

In the modification illustrated in Fig. 7, the carline members have horizontal top flanges 29, thereby limiting the contact between the hatch frame and said carline members to the downwardly converging portions thereof; and the flange, which surrounds the opening in the hatch sheet, is secured by rivets 28 to the side walls of the wide upper portion of said frame.

The hatch construction hereinbefore described has numerous advantages. The shape of the hatch frame permits it to rest on and be supported directly by the carline members; and it also permits easy removal and replacement of the hatch sheet without disturbing the hatch frame, as the upwardly converging side walls of the hatch frame provide ample clearance between the opening in the hatch sheet and the upper end of the hatch frame. The resiliency of the flange around the hatch opening in the roof sheet serves to maintain said flange in contact with the hatch frame while it is being welded thereto and thus prevents the welding material or sparks from getting below the roof sheet and igniting the insulation; and it also permits said flange to yield slightly and accommodate itself to slight misalinement of the hatch frame and the opening in the hatch sheet and still remain in contact with the hatch frame. The resilient engagement of said flange with the upwardly converging upper side walls of the hatch frame also serves to support the roof sheet in the region of said opening. The web, which connects the upwardly converging upper side walls of the hatch frame with the downwardly converging lower side walls thereof, serves to stiffen the section against deflection and to provide a rigid abutment for receiving the shock of ice striking thereagainst.

Welding of the hatch frames to the two carline members forms a strong and rigid carline assembly that can be assembled off the car and furnished for application to the car as a complete preassembled unit.

What I claim is:

1. A hatch construction for car roofs comprising a roof sheet provided with a hatch opening, spaced carline members located below said roof sheet and extending across said opening adjacent to opposite sides thereof, and a metal hatch frame for said opening supported on the portions of said carline members that cross said opening.

2. A hatch construction for car roofs comprising a roof sheet provided with a hatch opening, spaced carline members located below said roof sheet and extending across said opening adjacent to opposite sides thereof, and a metal hatch frame for said opening supported on and rigidly secured directly to the portions of said carline members that cross said opening, whereby said hatch frame forms a rigid cross connection between said carline members.

3. A hatch construction for car roofs comprising a roof sheet provided with a hatch opening, spaced carline members located below said roof sheet and extending across said opening adjacent to opposite sides thereof, and a metal hatch frame for said opening supported on and rigidly secured directly to the portions of said carline members that cross said opening, whereby said hatch frame forms a rigid cross connection between said carline members, and means for rigidly securing said hatch frame to said sheet along said opening.

4. A hatch construction for car roofs comprising a roof sheet provided with a hatch opening, spaced frame members located below said opening, and a metal hatch frame having a relatively wide upper portion fitting said opening and resting on said frame members and a relatively narrow lower portion fitting between said frame members.

5. A hatch construction for car roofs comprising a roof sheet provided with a hatch opening, spaced frame members located below said opening, and a metal hatch frame having a relatively wide upper portion fitting said opening and resting on and rigidly secured to said frame members and a relatively narrow lower portion fitting between and rigidly secured to said frame members.

6. A hatch construction for car roofs comprising a metal roof sheet provided with a hatch opening, a metal hatch frame fitting in said opening, said roof sheet having an upstanding flange surrounding said opening and connected to the body of said sheet by a curved portion of relatively large radius, and means for rigidly securing the upper portion of said flange to the sides of said hatch frame.

7. A hatch construction for car roofs comprising a metal roof sheet provided with a hatch opening, a metal hatch frame fitting in said opening, said roof sheet having an upstanding flange surrounding said opening and connected to the body of said sheet by a curved portion of relatively large radius, and means for rigidly securing the upper portion of said flange to the sides of said hatch frame, said sides of said hatch frame converging upwardly from the flange engaging portions thereof to the upper end thereof.

8. A hatch construction for car roofs comprising a roof sheet provided with a hatch opening, spaced frame members located below said opening, and a metal hatch frame having a relatively wide upper portion fitting in said opening and extending above said roof sheet and resting on said frame members, and a relatively narrow lower portion located between said frame members and tapering towards its lower end to provide a seat for a tapered hatch plug.

9. A hatch construction for car roofs comprising a roof sheet provided with a hatch opening, spaced frame members located below said opening, and a metal hatch frame having a relative-

ly wide upper portion fitting in said opening and extending above said roof sheet and resting on said frame members, and a relatively narrow lower portion located between said frame members and tapering towards its lower end to provide a seat for a tapered hatch plug, said upper portion tapering towards its upper end and terminating at the top of said frame in an inwardly extending flange.

10. A hatch construction for car roofs comprising a roof sheet provided with a hatch opening, spaced frame members located below said opening, and a metal hatch frame having a relatively wide upper portion fitting in said opening and extending above said roof sheet and resting on said frame members, and a relatively narrow lower portion located between said frame members and tapering towards its lower end to provide a seat for a tapered hatch plug, said upper portion tapering towards its upper end and terminating at the top of said frame in an inwardly extending flange, said roof sheet being provided around said opening with a flange that bears flatwise against the tapering upper portion of said hatch frame.

11. A hatch construction for car roofs comprising a roof sheet provided with a hatch opening and an upstanding flange surrounding said opening, spaced frame members located below said opening and provided with downwardly converging sides and downwardly and inwardly inclined tops, and a metal hatch frame having a relatively wide upwardly tapering upper portion fitting in said opening, a relatively narrow downwardly tapering portion fitting between the downwardly converging sides of said frame members, and an inclined shoulder between said upper and lower portions adapted to rest upon the inclined tops of said frame members, and means for securing said hatch frame to said roof sheet flange and to said frame members.

12. A hatch construction for car roofs comprising a roof sheet provided with a hatch opening, spaced frame members located below said opening, a metal hatch frame having a relatively wide upper portion fitting in said opening and a relatively narrow lower portion located between said frame members and forming a shoulder adapted to rest upon the tops of said frame members, said upper portion of said hatch frame tapering towards its upper end, said roof sheet being provided along the margin of the hatch opening therein with an upwardly and inwardly inclined flange adapted to bear resiliently against the tapering sides of the upper portion of said hatch frame, and a weld extending continuously along the upper edge of said flange for securing it to said hatch frame.

13. A hatch construction for car roofs comprising a hatch sheet provided with a hatch opening, and a hatch frame supported in said opening and having a portion extending beneath said roof sheet for supporting the same in the region of the hatch opening.

14. A hatch construction for car roofs comprising a hatch sheet provided with a hatch opening, spaced frame members located below said opening, and a metal hatch frame having a relatively wide upper portion fitting in said opening and resting on said frame members, and a relatively narrow lower portion located between said frame members, and an outstanding flange extending beneath said sheet for supporting the same in the region of said opening, said roof sheet having an upstanding flange along the margin of said opening, and means for securing said flange to the upper portion of said hatch frame.

15. A hatch construction for car roofs, comprising a hatch sheet provided with a hatch opening, spaced frame members located below said opening, and a metal hatch frame having an upper portion fitting in said opening and resting on said frame members, and a lower portion located between said frame members, said frame members extending laterally beyond the upper portion of said hatch frame beneath said roof sheet to constitute supports therefor.

16. A metal hatch frame comprising a relatively wide upper portion, a relatively narrow lower portion, a shoulder connecting said portions, and a flange extending outwardly beyond said upper portion.

17. A metal hatch frame comprising a relatively wide upper portion, a relatively narrow lower portion, a shoulder connecting said portions, and a flange extending outwardly beyond said upper portion, said upper portion terminating at the top of said frame in an inturned flange, and said lower portion having downwardly converging sides.

18. A carline assembly adapted for application as a complete unit to a car roof having hatchways therein, said carline assembly comprising spaced metal carline members and a metal hatch frame rigidly secured to said carline members and forming a rigid cross connection therebetween, said metal hatch comprising a relatively wide upper portion resting on said carline members and a relatively narrow lower portion located between said carline members.

19. A hatch construction for car roofs comprising a metal roof sheet provided with a hatch opening, a metal hatch frame for said opening having upwardly converging sides, said roof sheet having a flange surrounding said opening and said frame and converging upwardly for engagement with the upwardly converging sides of said hatch frame, and means for securing said flange to the sides of said hatch frame.

20. A hatch construction for car roofs comprising a roof sheet provided with a hatch opening, spaced frame members, and a metal hatch frame having a relatively wide upper portion fitting in said opening and extending above said roof sheet and resting on said frame members, and a relatively narrow lower portion located between said frame members and tapering towards its lower end to provide a seat for a tapered hatch plug, said upper portion tapering towards its upper end.

21. A metal hatch frame comprising a relatively wide upper portion, a relatively narrow lower portion, and a shoulder connecting said portions, said upper portion having upwardly converging side walls.

22. A hatch construction for car roofs comprising a hatch sheet provided with a hatch opening, a metal hatch frame having a portion fitting in said opening and an outstanding flange extending beneath said sheet in contact with the underside thereof around said opening, and means for securing said sheet to said hatch frame around said opening.

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